THE WILSON BULLETIN

A QUARTERLY MAGAZINE OF ORNITHOLOGY
Published by the Wilson Ornithological Club

Vol. XLII SEPTEMBER, 1930 No. 3

Vol. XXXVII (New Series) Whole Number 152

NESTING OF THE SANDHILL CRANE IN FLORIDA

BY ERNEST G. HOLT

The conclusion of a short field assignment with the Cleveland Museum of Natural History found my wife and me, at the end of February, 1924, in the famous Kissimmee Prairie region of peninsular Florida. We were stopping in the home of a hospitable cattle man of a passing regime—a house that had offered shelter to wandering ornithologists before this—and, as the infrequent mails were bringing news of increasingly severe weather in the north, we became more and more reluctant to leave the brilliant skies, luscious oranges, and teeming bird-life that were ours without greater effort than a stroll through our host's hammock. However, the clinching argument that determined we should stay was furnished by the indescribable rolling, gurgling calls of a flock of Sandhill Cranes (*Grus mexicana* (Muller)) that passed every day over the hammock in their flights to and from their feeding grounds in the river marsh.

Others have studied the Sandhill Crane along the Kissimmee and I have knowledge of a number of sets of eggs that have been taken there in the past, but examination of the literature at my disposal fails to disclose any very adequate account of the nesting of the species. Therefore, in spite of the fact that we were not equipped with proper photographic apparatus for the kind of work most needed, and that other circumstances brought about our departure right at the height of the nesting season, it is deemed wise to record in detail our observations on this vanishing species. Whatever contribution these notes may furnish is presented as an independent study, with no attempt at an exhaustive review of the literature.

The Country

Facing a broad marsh that extends for miles up and down the opposite side of the river, Sid Pearce's house stands amidst a magnificent assemblage of moss-bearded live oaks and stately cabbage palms in a hammock on the right bank of the Kissimmee River (Figures 2 and 3). A better place for bird-study than this riparian hammock could hardly be imagined. Without getting out of sight of the house

we recorded almost every species to be found in the whole countryside. On our first short stroll along the sandy road between the river and the jungle we saw, in or near the water, Pied-billed Grebes, Water-Turkeys, Lesser Scaup Ducks, Ward's, Louisiana, and Little Blue Herons, Wilson's Snipes, Killdeers, Kingfishers, Phœbes, Fish Crows, Red-wings, Boat-tailed Grackles, and Tree Swallows; in the hammock were Red-shouldered Hawks, Sparrow Hawks, Red-bellied Woodpeckers, Flickers, Blue Jays, Shrikes, Cardinals, Mockingbirds, and Thrashers. Myrtle and Palm Warblers were everywhere, and from the dense undergrowth of saw-palmettos issued unceasingly a subdued rustle—the scratching of scores of pairs of little Towhee feet among the fallen leaves. Later, Caracaras were seen in this same hammock; and a Pileated Woodpecker came more than once to the trees in the very yard. Such was our base.

Two miles north-northeast, on the edge of an extensive pine "island", is the little hamlet of Bassenger, its few scattered houses almost lost in a thicket of guava bushes. Between, stretches the road from Sebring, carried over the river and marsh on a series of bridges. Traffic on this road, still unimproved at the time of our visit, was not heavy, and from the bridges could be seen in the surrounding marsh a numerous and contented population of Florida Ducks, White Ibises, herons, Coots, and other water-loving species. Here too dwelt the Limpkins, which, as if sensing the approach of civilization and their impending doom, made night disconsolate with their loud lamentations. Back from the road, along the shallow edges of the marsh, a flock of a dozen Sandhill Cranes daily sought their food.

The pine "island" beginning at Bassenger extends in irregular outline for several miles to the north, east, and southeast. The timber is neither very thick nor of large size, and the dominant undergrowth is saw-palmetto. At intervals there are small hammocks of hardwood, or, more frequently, open spaces of several acres occupied by shallow ponds. On the northern edge of the "island" a pair of Bald Eagles had their aerie about fifty feet up in a tall pine. Beyond, the horizon is broken only by a few cabbage palms, and by a quadrangle of eucalyptus trees which stand as a forlorn, incongruous monument marking the burial place of the hopes and fortunes of many a poor farmer from the North. Once a hotel stood among these trees and a railway had its terminus not far distant. An orange tree more than fifteen years old had been transplanted, fruit and all, from Bassenger—and had lost a dozen years in transit. Maine potatoes were dug by the peck from beneath carefully nurtured little plants, right before the

FIGURE 2. A meander of the Kissimmee River near Bassenger. Moss-draped live oaks line the banks.

FIGURE 3. The edge of the Kissimmee Marsh. One of the cabbage palms at the right harbored a nest of Audubon's Caracara.

astonished eyes of those who had come to buy the worthless prairie. But truth will prevail. The ties of the railway became fence posts on a neighboring cattle ranch which, in its turn, has become bankrupt. Despite numerous attempts at colonization this section remains perhaps the wildest of any in the State, except the Everglades, and one may ride for fifteen or twenty miles in some directions without encountering a human habitation. Soon, however, another railroad will rattle its way over the prairies and this time it will be a branch of one of the big systems. Even while we tarried, its engineers were surveying a bridge site below Pearce's.[1]

Another pine-land ("Big Pine Island"), essentially like that at Bassenger, lies four or five miles west of Pearce's Hammock. Except for these and the oak hammocks along the river the country is a vast level expanse of prairie covered with stunted saw-palmetto and sparse grasses and shrubs, and dotted here and there with cabbage palms and occasional "heads" of bay, gum, or cypress. The soil throughout the prairies is sandy and infertile, appreciated only by gopher tortoises and Burrowing Owls.

Ponds are everywhere, throughout prairie and pine-land alike, and of sizes varying from the merest puddle to lakes acres upon acres in extent. All are shallow, in varying degrees, and their water content is dependent upon rain. During our stay the season was wet and the ponds exceptionally full. The greater area of most ponds is grown up with a peculiar shrub (*Hypericum fasciculatum*) which, because of its resemblance to one of the stunted conifers, is called "guinea cypress", while the centers of the deeper ponds support a rank growth of pickerel weed (*Pontederia cordata*). These two plants furnish the principal nesting material of the Sandhill Cranes. The deepest ponds often surround a central core of bay, gum, or cypress, called in the parlance of the country a "head". It is seldom possible to ride a horse to these trees. About the margins of the ponds is a border of broom-sedge or wiry grasses or sedges that is overflowed only when the ponds are very full. It is about these ponds and their immediate environs that the life of the Sandhill Crane centers.

The Bird

Even in its natural haunts the Sandhill Crane is a most conspicuous bird. Of huge size, it could scarcely be overlooked although standing motionless on the prairies; certainly not while flying with neck and legs stretched to their utmost, the great wings beating regu-

[1]The manuscript of this article was completed in September, 1924. The railway has since become an accomplished fact.

FIGURE 4. Nest No. 3. General view showing comparative size of the nest.

FIGURE 5. Nest No. 3. (Egg set No. 212). Detail of the nest and eggs.

larly but with quick upward jerks as if actuated by springs. And were this not enough, when it takes the air the bird gives utterance to its peculiar call that is sure to demand instant attention of anyone within range of its vibrations. Fortunately the bird realizes its conspicuousness and, except when sitting on the nest, seeks safety in flight rather than in concealment. Its extreme wariness was well impressed upon me during the many days spent in the attempt to take a couple of specimens for the museum.

The conspicuousness of the birds is apt to give a false impression of their abundance. Though easily seen, their numbers are few. An indication of actual abundance may be obtained from the following four censuses: (1) February 11, five groups of 2, 3, 3, 2, and 2, respectively, were seen on a nine-mile ride across the prairie and pineland southwest of Pearce's; (2) February 29, on a fourteen-mile traverse to the southwest, 3, 2, 1, 2, and 2 were seen; (3) March 21, an all-day ride northeast and north of Bassenger netted 2, 2, 1, 2, 1, and 3; and (4) on March 23, a whole day's ride, again southwest of Pearce's, produced 2, 2, 2, 2, 1, 2, 2, 3, and 2 cranes. The greatest number seen in any one flock was the dozen apparently unmated birds that ranged together in the river marsh opposite Pearce's.

With the exception of this last flock all the cranes observed were found about the shallow ponds on the prairie and the edges of the pine "islands". While not necessarily in the water, no bird was ever found, even while feeding, at any great distance from it. In almost every pond a lone Ward's Heron stood guard—a solitary sentinel in neutral blue-grey—and the eye eagerly scanning his retreat for a crane often mistook him for the bird sought. However, the reverse was never true. No crane was ever passed by for a heron. In the field the crane is distinctly browner and less blue than the heron and its body is much fuller and heavier and is held more horizontally. The crane was never observed to assume the post-like posture so often affected by the heron.

Truly the Sandhill Crane is a remarkable bird, from every point of view, and no written description can do it justice. It is but another example of the truism that an animal can not be rightly understood apart from its environment. A Sandhill Crane may be seen mounted, in almost any museum, but to appreciate the living bird, pulsating with life and regal in its freedom, one must also visualize the wide-reaching prairies with a fretwork of pines against the horizon, the ponds reflecting the clear blue of the limitless vault in which floats no cloud;

FIGURE 6. A Prairie Pond. One of the myriad dotted thickly over the whole countryside.

FIGURE 7. Nest No. 4. (Egg set No. 215). The only nest found on dry ground.

above all he must himself thrill to the resonance of its wonderful voice—the essence, the very spirit of the wild free open spaces where it makes its home.

The Nests

On our long rides over prairies and pine-land we were fortunate enough to find, in all, ten nests of the Sandhill Crane. Inasmuch as the published accounts of the nesting habits of the species are rather general in their terms, we are presenting the observations we were able to make, in the same detail in which they appear in our field notebooks.

Nest No. 1. On February 28, we rode eight miles to see a nest that had been reported to us. It was a small platform of herbaceous plant stems, built up barely above the water level in the shallow margin of a prairie pond—but evidently our informant had taken the precaution to remove the eggs. No birds were seen.

Nest No. 2. February 29. A nest in process of construction was found in the deep water at the center of a pond among the pines. It was merely a flat platform of pickerel weed stalks, built among living plants of the same species. March 14, two cranes were seen near this nest, but no further work had been done on it. Probably the frequent passing of a motor truck, hauling materials for the construction of a dipping vat on this "island", caused the abandonment of the nest.

Nest No. 3. March 14. While riding across the prairie we flushed from an old burn a single Sandhill Crane which flew to a near-by pond. We followed, of course, whereupon two Sandhill Cranes left the pond and disappeared across the prairie. A short search was sufficient to reveal the conspicuous nest, a nearly flat platform of sticks and woody stems of "guinea cypress", exposed in a sparse growth of broom-sedge and "guinea cypress" near the edge of the pond (Figures 4 and 5). The structure was about two and one-half feet in diameter and was built up from the bottom, in water six or seven inches deep, until the rim was three or four inches above the surface. The two eggs, though not pipped, contained embryos that were cheeping distinctly within the shells, but fearing that others might not be found we collected them anyway. The nest was examined again on March 23, but there was no indication that the parents had made any further use of it.

The eggs (Set No. 212) measure 93.5x60.5 and 94x61 mm. The ground color of one is very pale olive-buff, of the other, almost olive-buff. Both are marked with roundish spots, rather than blotches, of cinnamon brown and with obscure spots of pale purplish tints,

FIGURE 8. Nest No. 5. General view of the grassy swale.

FIGURE 9. Nest No. 5. (Egg set No. 217). Detail of the nest and egg. Note the water-soaked spot at the right of the egg.

thickest about the larger ends. The darker egg has a wreath of spots about the larger end.

Nest No. 4. March 21. The flushing of the parent led to the discovery of this nest in a location we would otherwise never have searched—among the saw-palmettos and laden gall-berry bushes of the open prairie. The frail structure, composed of dried grasses and palmetto leaves, a couple of oak twigs and some green "guinea cypress", was about two and one-half feet in diameter and was placed flat on the dry ground (Figure 7). Though situated between two ponds it was about 100 yards from the nearest water. The nest was evidently very new (as some of the grass beneath it was still green) and contained two fresh eggs.

These (Set No. 215) measure 89x60.5 and 93.5x59 mm. One is long-ovate, olive-buff with greenish cast, and blotched all over, but more thickly at the larger end, with tones of lavender and brown. The other is ovate, ground color nearest to deep olive-buff, marked all over with long blotches of wood brown and darker shades of brown and with a thick patch of blotches on the larger end (Figure 14, bottom set).

Nest No. 5. March 22. A nest about two feet in diameter, constructed of dried grasses and superimposed on a low mat of living marsh grass raked together in water about five inches deep, was discovered in a grassy swale between two large ponds on the prairie (Figure 8). The highest part of the nest rim was not over three inches above the water, and the center of the nest, in which the single egg lay, was saturated. This wet spot is evident in the accompanying photograph (Figure 9). Though the situation was entirely exposed the parent sat close until we had approached within about fifty feet.

The egg (Set No. 217), which contained a net of blood vessels, measures 99.5x61 mm. It is long oval-elliptic, the ground color olive-buff with greenish cast, and is marked with generally distributed blotches of buffy-brown and lavender tints (Figure 15, lower-right egg).

Nest No. 6. March 23. A brilliant morning had found us in the saddle as soon as breakfast was over, but success had not been measured by the miles behind us when at noon we rode into the edge of a pine "island". Here a chain of ponds stretched away among the trees, forming open spaces like little land-locked bays. It was but logical to "ride out" these ponds, and we had not gone far when, in the distance, a lone Sandhill Crane was seen stalking sedately through the shallow water. Suddenly, as if by magic, another appeared beside

FIGURE 10. Nest No. 6. The pond in the edge of the pines. Note the dark patch of pickerel weed in the center.

FIGURE 11. Nest No. 6. (Egg set No. 218). Detail of the nest and eggs, showing comparative size.

it, and then the two sprang into the air and with ponderous wing-strokes passed out of sight among the pines, leaving, as Coues has so aptly said, an impression of "momentum from mere weight—of force of motion without swiftness". I sat enthralled. The crystal-clear atmosphere, the brilliant sunshine flooding from a cloudless sky; the rich contrasting tones of pine boles and leaves, of sere grasses and luxuriant pickerel weed; the soothing fragrance of resin warmed by a noontide sun; and the wild reverberant calls of the cranes echoing back through the pines combined to produce in my inner consciousness that peculiar feeling of well-being which comes only with perfect adjustment to the environment. But I was soon aroused by Mrs. Holt's delighted cry and pointing arm, and rode quickly forward to behold the object of our search.

There in the shallow margin of the pond where the water was only about five inches deep, the cranes had built their nest in a sparse growth of "guinea cypress" that afforded not the slightest concealment. This nest was a rather frail structure of "guinea cypress" shrubs that had been pulled up by the roots from the immediate environs, some so recently that they still bore green leaves, and was lined thinly with dried broom-sedge. The almost flat platform was about three feet in diameter, its surface but little more than two inches above the water level, and on it lay two fresh, very dissimilar eggs (Figures 10 and 11). The center of the pond, some distance away, was filled with a rank growth of pickerel weed, the "flag" of the natives.

The eggs (Set No. 218) measure 86.5x59 and 89x61 mm. Both are truncate-ovate. The first, which is the darkest of the entire collection, is deep olive-buff marked, principally about the larger end, with splotches of shades of brown from wood brown to almost black (in a few spots of especially dense pigment). The other, the lightest in the collection, is greenish white, marked, also principally about the larger end, with minute dots and small spots of lavender and buff-brown tones (Figure 11, middle set, and Figure 15, top set of eggs).

Nest No. 7. March 23. After leaving Nest No. 6 we had heard cranes calling in the direction of another pond in the pines, but we had ridden on to some cattle pens to feed our horses and eat our own lunch. Later, when we came back to this pond, everything was quiet. A couple of Ward's Herons arose without haste and flapped silently away; no other bird was in sight. Then my searching eye descried a crane standing in the pond on the farther side, but even as I tried to point it out, it disappeared—vanished utterly—though I was absolutely certain no bird had left the pond. Perhaps it had crouched;

FIGURE 12. Nest No. 7. (Egg set No. 219). Constructed of pickerel weed in the deepest part of a pond among the pines.

FIGURE 13. Nest No. 10. (Egg set No. 220). This nest was the largest and the highest above water of all examined.

but it seemed more likely that my eyes had seen a crane because that was what I most wanted to see, had for the instant constructed one of a tuft of "guinea cypress". Nevertheless we sent our animals splashing across the pond, though the nearer we approached the other side the more it seemed that my eyes had deceived me. Then, when just on the edge of a patch of pickerel weed, which almost invariably marks the deepest basins in the larger ponds, we plainly saw not a phantom, but a crane, crouched as low on its nest as its huge bulk would permit, its neck lying flat so that its red crown was visible only at short range (Frontispiece). It retained this position while I dismounted and waded slowly forward; then it arose, its feet still on the nest, and, springing into the air, flapped majestically off without uttering a sound. A few minutes later, accompanied by its mate, it returned and flew calling about the pond.

The nest was a mass of dead pickerel weed stalks raked up to form an island in water more than a foot deep, and was surrounded by a living growth of the same plant (Figure 12). Its top was a platform of uneven surface only a couple of inches above the water; plainly not high enough, for the under surfaces of the two eggs, and the nest beneath them were wet, and the pores of the eggs were stopped with what appeared to be mildew. In spite of this, however, the eggs contained small embryos that seemed to be alive.

The eggs (Set No. 219) measure 97x60.5 and 101.5x63.5 mm. Both are long-elliptic, and in color between olive-buff and pale olive-buff, marked with small irregular spots of tones of lavender and brown scattered over the whole surface, but more thickly about the larger ends (Figure 14, top set of eggs).

Nest No. 8. March 23. An uncompleted nest of dead pickerel weed was found among live plants of the same kind in the deeper part of a shallow pond on the prairie.. A pair of cranes were seen near at hand.

Nest No. 9. March 24. A new but still empty nest of "guinea cypress" and broom-sedge was discovered in the shallow margin of a pond in the outer fringe of trees on a pine "island." It was about two and one-half feet in diameter and was placed in a very exposed situation. A pair of cranes flushed from among the neighboring pines manifested considerable interest in this nest.

Nest No. 10. March 24. After an unsuccessful excursion for Burrowing Owl eggs, we were riding homeward about 6 P. M. and I was scanning a large prairie pond as a matter of routine, for we had neither seen nor heard a crane, when my eye was caught by a sug-

FIGURE 14. Eggs of the Sandhill Crane. Sets No. 219 (top), 218 (middle), and 215 (bottom), illustrating the variety of tones and markings.

gestive lump of gray out among the green pickerel weed. Investigation disclosed a Sandhill Crane sitting close, with head flat down on the nest in an effort to conceal the conspicuously red crown. This bird allowed an approach within fifty yards before flushing.

The nest, built entirely of dead pickerel weed, was a large, dry, firm structure about three feet in diameter with its surface raised several inches above the water, which was here about a foot deep. As the nest material would indicate, it was built among the green pickerel weed growing in the center of the pond. Of all that we examined this nest was the largest and highest above water (Figure 13).

The single egg (Set No. 220), which contained a small embryo, measures 96x59 mm. It is long-oval, sharply pointed, and in color pale olive-buff, marked with small roundish spots, principally about the larger end, of tints of olive-brown and lavender (Figure 15, middle egg).

Habits

It is natural to expect some diversity of habit in such a wide-ranging species as the Sandhill Crane, and upon comparing our notes with the few meager accounts of this species which have so far been published we find that the Florida birds have seemingly developed habits peculiar to themselves. The most striking of these is that the Florida cranes are not migratory, but spend their entire lives in the same general region where they are born.

The Florida birds too seem to follow a rather definite rule in their choice of nesting sites, whereas the species as a whole exercises considerable latitude. Baird, Brewer, and Ridgway[2] state that in southeastern Oregon Captain Bendire found the Sandhill Crane breeding on the lowlands as well as in the highest mountain valleys, and quote Cooper to the effect that it builds its nest on some elevated spot on the ground, among ferns, where it may be partly concealed, and yet whence the approach of danger can be perceived. Gundlach (as quoted by Barbour[3]) reports that the Cuban Sandhill Crane hides its nest under some bush or shady tussock of high, rank grass. While, according to Coues[4], Dall obtained eggs on the Yukon River that were laid in a small depression in the sandy beach, without any attempt at a nest[5]. Although Moore (quoted by Baird, Brewer, and Ridgway) found

[2]Baird, Brewer, and Ridgway. *The Water Birds of North America.* Vol. I. Memoirs Museum of Comparative Zoology, Vol. XII. Boston, 1884, pp. 409-412.

[3]Barbour, Thomas. *The Birds of Cuba.* Memoirs Nuttall Ornithological Club, No. VI. Cambridge, Mass., 1923, p. 59.

[4]Coues, Elliott. *Birds of the Northwest.* Misc. Publications No. 3, U. S. Geological Survey of the Territories. Washington, 1874, pp. 533-534.

FIGURE 15. Eggs of the Sandhill Crane. Sets Nos. 218 (top), 220 (middle), and 217 (bottom right) illustrating the variety of form.

Florida nests placed on the dryest ground, among the saw-palmettos, and we were assured by Mr. Pearce that in wet seasons the cranes often resort to such places to make their nests, our experience would indicate that the normal nesting site of the Florida Sandhill Crane is a shallow pond, preferably its margin, wherein it can construct an island of its own. The season at the time of our visit was said to be exceptionally wet, and all the ponds were very full, yet only one of the ten nests we examined was built upon dry ground.

The dry-ground nests found by Moore were formed of pliable stuff, herbs, grasses, and the like, but never of stiff material or sticks. In one instance the nest was composed of grasses plucked up by the roots, with much sand attached. Our observations convince us that the choice of nesting material is purely a matter of convenience. The nests found by us were without exception constructed of the materials nearest at hand, whether they happened to be marsh grass, pickerel weed, "guinea cypress", or saw-palmetto.

The literature and our own observations indicate considerable individual variation in the time of nesting of the Florida Sandhill Cranes. Scott[6] writes that at Tarpon Springs the birds mate in January, build the last of that month or early in February, and hatch their young about March 1. Childs[7] took a set of two eggs in Manatee County on February 15. On March 11 a young bird which already stood two feet in height was brought to Bryant.[8] On the same date Bryant found a nest containing two eggs in which incubation had just begun; another, containing two fresh eggs, was found on March 15: and a third, also discovered on March 15, contained two eggs nearly hatched. Our first eggs were found on March 14 and were ready to hatch, while ten days later we found a new nest in which the eggs had not yet been deposited.

The eggs themselves exhibit the greatest diversity in both color and form. This is true of those of the birds of even a restricted area like the Bassenger region, as may be seen by referring to Figures 14 and 15. Nevertheless, it is remarkable that the greatest color difference among the eggs of our collection should occur between two

[5]These were probably the eggs of the Little Brown Crane, a closely related form.

[6]Scott, W. E. D. *A Summary of Observations on the Birds of the Gulf Coast of Florida.* The Auk, Vol. VI, 1889, p. 152.

[7]Childs, John Lewis. [Letter quoted by Editor.] The Oologist, Vol. XIX, 1902, p. 56.

[8]Bryant, Henry. [Paper read before the Boston Society of Natural History.] Proceedings Boston Society of Natural History, Vol. VII, 1859-1861, p. 14.

eggs of the same set (No. 218; Figure 14, middle set, and Figure 15, top set).

Cranes, unlike their long-legged cohabitants of the ponds — the herons — are præcocial and their young are able to run about very shortly after hatching, but, according to Bryant the young remain with their parents until fully grown, and are fed for a long time by regurgitation. They do not fly until they are as large as the adults, but run with great speed, and hide like young partridges.

Cooper, so we are told by Baird, Brewer, and Ridgway, saw returning flocks of Sandhill Cranes passing northward over the Colorado Valley about the 13th of March. "At this season they rise from the ground by laborious flappings, circling around higher and higher, until they get so far up as to seem like flocks of butterflies, and they gradually move northward." Other authors mention the soaring of the Sandhill Crane, but in Florida such a phenomenon is never observed. The explanation of this is, no doubt, that soaring is correlated with migration, and the Florida birds are non-migratory. Apparently they never voluntarily take the air except to pass from place to place, and at such times rise to no greater height than necessary to clear the obstacles in their paths.

According to Baird, Brewer, and Ridgway, the Sandhill Crane does not usually frequent the seashore, nor it is often found in wet places, but prefers dry prairies, ploughed fields, sandy hills, and like places, and in this respect is unlike the heron family. Barbour says the Cuban Sandhills are not often seen about water. The Florida birds, it is true, spend a large part of their time feeding on the dry prairie, and, as in other regions, are attracted by burned areas, but their lives are so centered about the ponds, and they were so plainly attached to the river marsh that we find it impossible to disassociate them from a watery environment.

A Warning

In days gone by the Sandhill Crane bred over most of the great interior plains of North America, from western Canada southward, and during migration was often found in large flocks. Coues relates that thousands of Sandhill Cranes repaired each year to the Colorado River Valley, flock succeeding flock along the course of the great stream, from their arrival in September until their departure the following spring. Those immense flocks are now no more, and as a breeder the bird has withdrawn farther and farther to the north until today its nest is rarely found in the West south of the Canadian border. Moreover, it is found in no great numbers north of it. Recent faunal

papers indicate that the species is nowhere common west of the Mississippi, though it is resident in small numbers on the coast of Louisiana; east of the Mississippi it is almost unknown except in extreme southern Georgia and in Florida.

Florida, in fact, is generally agreed to be the Sandhill Crane's last stronghold. But alas! it is far from strong. Heretofore, inaccessibility of the country inhabited by the cranes has limited their human enemies to the natives who shoot them for food only, or to the occasional collector who takes a few specimens of the birds or robs them of a few sets of eggs. Now, the situation is different. Even as I write, a project is well under way to pave the road of deep sand between Sebring and Okeechobee, and probably before this article leaves the press a continuous stream of automobiles will be flowing through the very heart of the crane country.

The ultimate result of much "improvement" is as obvious as it is inevitable. Notwithstanding its extreme wariness and great sagacity, the Sandhill Crane must surely give way, like the Seminole Indian and the Ivory-billed Woodpecker, before this ruthless encroachment upon its retreats. Its wild note can not compete with the honk of the automobile.

Must the last of the Sandhill Crane's prairies be converted into worthless farms while countless acres of good arable land lie idle in near-by states? Must the tourist's automobile be given right of way through the last remaining wild spots? No! The Sandhill Crane is too splendid a creature to be thus swept out of existence. Its preservation must be considered in any scheme designed to open up interior Florida, but only the powers of State or Union are strong enough to confound the real estate promoter and hold some of the "waste places" inviolate. And there is no time to lose.

Acknowledgments

The frontispiece is from the brush of Mr. George Miksch Sutton, to whose kindly interest a valuable feature of this paper is due. So far as I am aware, the Sandhill Crane has not before been depicted in crouching posture.

For assistance and unfailing courtesy in the field, our grateful thanks are extended to Messrs. W. Sid Pearce and Marvin H. Chandler, of Bassenger. True sons of Florida, simple and unspoiled, these men are as devoted to their native haunts as are the Sandhill Cranes them-

selves. Even now I can see, beneath a broad Stetson, the contented smile stealing over Pearce's weather-beaten features while he surveys his far-flung prairies, and the kindly twinkle in his eye as he turns in his saddle to ask, "Have you ever seen a purtier country than this?" And I can still answer with conviction, "I never have."

MONTGOMERY, ALABAMA.

THE DECLINE OF THE JACKSNIPE IN SOUTHERN WISCONSIN

BY ALDO LEOPOLD

The purpose of this paper is to present evidence of a recent decrease in jacksnipe or Wilson's Snipe (*Gallinago delicata*), to the end of stimulating action for the conservation of this bird and its habitat.

Its original abundance in the Mississippi Valley was probably beyond our present imaginative powers. Bogardus[1] (1874) killed 340 in a single day on the Salt Creek bottoms of the Sangamon River, and wagered to kill 100 straight in a day on this area. There were no takers. He says: "Our bag was seldom as small as seventy-five couple at the right time. . . . Snipe are vastly more abundant in the West . . . than in the East."

Kumlien and Hollister[2] (1903) say of the jacksnipe: "still common . . . [but] . . . we should be at a loss to express its numbers in former years." This refers especially to Walworth County, Wisconsin, where Kumlien began his observations about 1868.

Schorger[3] (1929) gives the jacksnipe as an abundant migrant in Dane County, but states that "a gradual decrease in numbers has taken place during the last fifteen years."

The extent of this recent decline may be roughly measured by means of the following table and chart, compiled from Schorger's ornithological notes for 1919-1929, and my shooting journal for 1924-1929.

The table reduces the number of jacksnipe seen and killed by each of us to yearly averages of the number "seen per trip" (Graph A) and the number "killed per hunt" (Graph B). The reason for distinguishing "trips" and "hunts" is that Schorger made many trips during

---

[1]Field, Cover and Trap Shooting, A. H. Bogardus, J. B. Ford & Co., N. Y., 1874, p. 136.

[2]Birds of Wisconsin, L. Kumlien and N. Hollister, Bull. Wis. Natural Hist. Society, Nos. 1-3, April-July, Milwaukee, 1903.

[3]Birds of Dane County, Wis., A. W. Schorger, Trans. Wis. Acad. Science, Vol. XXIV, Nov., 1929.